

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION**

TECHNICAL ANALYSIS

**Proposed Administrative Civil Liability
Contained in Complaint No. R9-2010-0085
Eastern Municipal Water District
Temecula Valley Regional Water Reclamation Facility**

**Noncompliance with
California Regional Water Quality Control Board, San Diego Region
Order No. R9-2000-0165, Waste Discharge Requirements for
Eastern Municipal Water District
Temecula Valley Regional Water Reclamation Facility,
Riverside County**

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By

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A. INTRODUCTION

This technical analysis provides a summary of factual and analytical evidence that support the findings in Complaint No. R9-2010-0085 to support an administrative assessment of civil liability in the amount of **\$1,035,310** against Eastern Municipal Water District (EMWD) for violation of Prohibitions contained in California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) Order No. R9-2000-0165, *Waste Discharge Requirements for Eastern Municipal Water District Temecula Valley Regional Water Reclamation Facility, Riverside County*.

EMWD owns and operates the Temecula Valley Regional Water Reclamation Facility (TVRWRF), located at 42565 Avenida Alvarado, Temecula California (see Exhibit 1, Location Map). The TVRWRF serves Temecula, Murrieta and portions of unincorporated Riverside County, and discharges up to 19.8 million gallons per day (mgd) of tertiary treated wastewater to various locations within the Santa Margarita River Hydrologic Area. The treatment plant is attended by staff 10 hours a day. During off hours there are alarms that connect with the EMWD central control in Perris, CA, allowing crews to be called out in case of emergencies. The TVRWRF is one of five reclamation facilities operated by EMWD and the only facility within the boundaries of the San Diego Water Boards jurisdiction.

On December 26, 2009 at 6:00 a.m., EMWD staff arriving at TVRWRF found untreated sewage overflowing from the influent structure (head works) to an offsite storm channel that discharges into Murrieta Creek, a water of the United States, near Via Montezuma Road. The surface flow of sewage in Murrieta Creek extended approximately one mile downstream of the discharge point at Via Montezuma Road (see Exhibit 2 for spill path map). It was later determined by EMWD that approximately 2.39 million gallons of sewage was discharged during this event. Cleanup efforts undertaken by EMWD enabled the recovery of 966,800 gallons of sewage, and re-introduced it back into the collection system for treatment.

As detailed further in this analysis, the cause of the sewage spill was determined to be a combination of factors, including:

1. The failure of a programmable logic controller (PLC) which issues run commands to the barscreen cleaners.
2. The PLC was a single point of failure and no engineered redundant controls were in place to run the barscreen cleaners, as is the case with other reclamation facilities under EMWD control.
3. Design problems with the Supervisory Control and Data Acquisition (SCADA) warning system, thereby allowing critical warnings to be acknowledged without dispatching technicians to investigate.
4. Plant operator error/lack of training on alarm response.

B. VIOLATIONS SUBJECT TO THE COMPLAINT

EMWD is required to operate and maintain the TVRWRF in compliance with requirements contained in San Diego Water Board Order No. R9-2000-0165, *Waste Discharge Requirements for Eastern Municipal Water District Temecula Valley Regional Water Reclamation Plant*, as amended.

The following violations against EMWD of Prohibitions contained in Order No. R9-2000-0165, Section 301 of the Clean Water Act and California Water Code (Water Code) section 13376 are the basis for assessing administrative civil liability pursuant to Water Code section 13350.

1. EMWD Discharged Untreated Sewage to Land

EMWD violated Prohibition A.1 of Order No. R9-2000-0165 which states “Discharges of waste to lands which have not been specifically described in the Report of Waste Discharge and for which valid waste discharge requirements are not in force are prohibited.” The discharge of 2.39 million gallons of untreated sewage flowed offsite to land areas not described in a Report of Waste Discharge (ROWD).

2. EMWD Created a Condition of Pollution, Contamination or Nuisance

EMWD violated Prohibition A.2 of Order No. R9-2000-0165 which states “Neither the treatment, storage nor disposal of waste shall create a pollution, contamination or nuisance, as defined by Section 13050 of the California Water Code.” The discharge of untreated sewage to Murrieta Creek altered the quality of the water of the creek, adversely affecting the beneficial uses of the creek, creating a hazard to public health, and thus meets the definitions of pollution, contamination and nuisance as defined by Water Code section 13050.

3. EMWD Discharged Untreated Sewage to a Navigable Water

EMWD violated Prohibition A.3 of Order No. R9-2000-0165 which states “Discharges of treated or untreated solid or liquid waste to a navigable water or tributary of a navigable water are prohibited unless authorized by a NPDES permit issued by the appropriate Regional Board.” The discharge of untreated sewage to Murrieta Creek was not authorized by a NPDES permit.

4. EMWD violated Basin Plan Prohibitions

EMWD violated Prohibition A.4 of Order No. R9-2000-0165 which states "The discharge shall not cause a violation of the prohibitions contained in the Basin Plan." The discharge of untreated sewage violates numerous Discharge Prohibitions contained in the San Diego Water Boards *Water Quality Control Plan for the San Diego Basin* (Basin Plan), including Waste Discharge Prohibitions 1, 2, 5 and 9.

5. EMWD Discharged Pollutants to Surface Waters without a NPDES Permit

EMWD violated section 301 of the Clean Water Act (33 U.S.C. § 1311) and Water Code section 13376 which prohibit the discharge of pollutants to surface waters except in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. The discharge of untreated sewage to Murrieta Creek was not in compliance with a NPDES permit.

C. DETERMINATION OF ADMINISTRATIVE CIVIL LIABILITY

Administrative civil liability (ACL) may be imposed pursuant to the procedures described in Water Code section 13323. The complaint alleges the act or failure to act that constitutes a violation of law, the provision of law authorizing civil liability to be imposed, and the proposed civil liability.

Pursuant to Water Code section 13350(a), any person or entity who, in violation of any Waste Discharge Requirements issued by a Regional Water Board, discharges waste, or causes or permits waste to be deposited where it is discharged into waters of the state, is subject to administrative civil liability pursuant to Water Code section 13350(e), either (1) on a daily basis not to exceed five thousand dollars (\$5,000) for each day the violation occurs; or (2) on a per gallon basis in an amount not to exceed ten dollars (\$10) per gallon of waste discharged.

Water Code section 13327 requires the San Diego Water Board to consider several factors when determining the amount of civil liability to impose. These factors include: "...the nature, circumstance, extent, and gravity of the violation or violations, whether the discharge is susceptible to cleanup or abatement, the degree of toxicity of the discharge, and, with respect to the violator, the ability to pay, the effect on ability to continue in business, any voluntary cleanup efforts undertaken, any prior history of violations, the degree of culpability, economic benefit or savings, if any, resulting from the violation, and other matters that justice may require."

The 2009 State Water Resources Control Board Water Quality Enforcement Policy (amended November 2009 and approved by the Office of Administrative Law on May 20, 2010)¹, Section VI, provides a penalty calculation methodology for Regional Water Boards to use in administrative civil liability cases. The penalty calculation methodology enables the water boards to fairly and consistently implement liability provisions of the Water Code for maximum enforcement impact to address, correct, and deter water quality violations. The penalty calculation methodology provides a consistent approach and analysis of factors to determine liability based on the applicable Water Code section.

The violations in the Complaint and this technical analysis are all “discharge violations” when considering Water Code section 13350(e) (2) and the Policy’s penalty calculation methodology. Therefore this analysis skips step three of the penalty calculation dealing with “non-discharge violations.”

1. Step 1: Potential for Harm for Discharge Violations

Pursuant to the Enforcement Policy, water boards shall calculate actual or threatened impacts to beneficial uses using a three-factor scoring system to determine a final score for potential for harm. The three factors utilized in the determination of the potential for harm score include; (a) the potential for harm to beneficial uses; (b) the degree of toxicity of the discharge; and (c) the discharges susceptibility to cleanup or abatement for any violation or group of violations. The scores for these factors are then added to give a final Potential for Harm score.

Based on the above scores for harm to the environment, risk to potential receptors, and susceptibility to cleanup, and as further detailed below, a score of **7** (seven) is assigned to Step 1 of the penalty calculation.

a. Factor 1: Harm or Potential Harm to Beneficial Uses

This factor evaluates direct or indirect harm or potential for harm from the violation. A score between 0 (negligible) and 5 (major) is assigned in accordance with the statutory factors of the nature, circumstances, extent and gravity of the violation.

The discharge of 2.39 million gallons of untreated sewage resulted in moderate harm or potential harm to the beneficial uses of Murrieta creek. Accordingly a score of **3** (three) is assigned to Factor 1 of the penalty calculation. The Enforcement Policy defines Moderate as:

¹ The Enforcement Policy may be found at:
http://www.waterboards.ca.gov/water_issues/programs/enforcement/docs/enf_policy_final111709.pdf

“Moderate – moderate threat to beneficial uses (i.e., impacts are observed or reasonably expected and impacts to beneficial uses are moderate and likely to attenuate without appreciable acute or chronic effects).”

About the TVRWRF

The TVRWRF resides within 1,300 feet of Murrieta Creek which is tributary to the Santa Margarita River. A shallow alluvial groundwater aquifer located beneath Murrieta Creek replenishes the Santa Margarita River. Both Murrieta Creek and the underlying aquifer flow into the Santa Margarita River at Temecula Gorge, approximately 3 miles down gradient of the TVRWRF. The Santa Margarita River is the source of drinking water for the U.S. Marine Corps Base Camp Pendleton. As established in the Water Quality Control Plan (Basin Plan) for the San Diego Water Board, the existing beneficial uses of ground water for Murrieta Creek include groundwater uses for municipal and domestic supply (MUN), agricultural (AGR), industrial process (IND) and service supply (PROC).

The existing beneficial uses of surface waters in Murrieta Creek include water uses for municipal and domestic supply (MUN), agricultural (AGR), industrial service supply (IND), ground water recharge (GWR), non-contact water recreation (REC-2), warm freshwater habitat (WARM) and wildlife habitat (WILD). Additionally, Murrieta Creek is listed under the 2008 Clean Water Act Section 303(D) List of Water Quality Limited Segments as an impaired water body for Chlorpyrifos, Copper, Iron, Manganese, Nitrogen, Phosphorus and Toxicity.

EMWD includes approximately 555 square miles in western Riverside County. EMWD is divided into five wastewater service areas including Temecula, Morena Valley, Perris, Hemet Valley/San Jacinto, and Winchester/Sun City. EMWD owns and operates regional water reclamation facilities in each service area. All of the service areas, except Temecula, are tributary to the San Jacinto River basin and fall under the jurisdiction of the Santa Ana Water Board. The Temecula service area is tributary to the Santa Margarita River Basin and is under the jurisdiction of the San Diego Water Board.

The TVRWRF was originally constructed in the early 1970s at a capacity of 1.0 mgd. By 1993, upgrades to the plant increased its capacity to 6.25 mgd for the primary and secondary facilities and 10 mgd for the advanced wastewater treatment facilities. Further expansion in 1996 increased the capacity of the primary and secondary treatment to 8 mgd. These facilities comprise Plant 1 and Phase 1 of Plant 2 which increased the treatment capacity to 15 mgd based on annual average flow (AAF), and Phase 2 of Plant 2 increased capacity to 18 mgd AAF. These upgrades included a common headworks, the aeration basins, additional tertiary filters, and increased solids handling facilities. This year, the TVRWRF will undergo modification to expand the on-site storage capacity and improve the solids handling capability of the facility. Planning is underway for the next expansion to 23 mgd.

A staff of about 20 are on-site operating the TVRWRF for 10 hours a day. During off-hours alarms connect the TVRWRF to the EMWD Integrated Operations Center (IOC) in Perris, California.

Sewage Discharge and Spill Response

In its technical report dated March 4, 2010, EMWD reports that on Saturday December 26, 2009, at 6:00 a.m., operations personnel arrived at TVRWRF and discovered wastewater spilling over the headworks (see Figure 1). Plant staff noticed that the two barscreen cleaners were not functioning and the intake screens had become clogged with debris. Upon discovery of the release, plant staff opened the bypass through the screen, allowing further influent flows back into the plant and terminating the discharge.



Figure 1. TVRWRF Headworks

The discharge of untreated sewage flowed north from the headworks across the pavement to an unvegetated drainage channel that runs west to east along the TVRWRF property line. The sewage went from the drainage channel, across an open field to the east of the plant, and then into another drainage channel running north to south, into a channelized vegetated tributary to Murrieta Creek which runs adjacent to Diaz Road. The surface flow then entered Murrieta Creek and travelled approximately one mile down stream, just past the Rancho California Road Bridge (see Exhibit No. 2). Murrieta Creek was experiencing low flow conditions at the time, so a majority of the Creek was dry.

Once TVRWRF staff became aware of the spill and the continuing discharge from the headworks had been stopped, plant staff blocked the flow to Murrieta Creek by sand bagging the drainage channel, and proceeded to close Via Montezuma road where it crosses Murrieta Creek (see Figure 2). Collection Staff was then mobilized utilizing vacor trucks and portable pumps to recover sewage within the discharge path, and return it to the collection system for treatment. Six-inch pumps were placed at Via Montezuma Road to collect areas of sewage that were pooling at the road crossing. Pumper trucks were mobilized at Via Montezuma Road and Rancho California Road.



Figure 2. Via Montezuma Road Crossing Murrieta Creek

Impacts to Beneficial Uses

The discharge of untreated sewage to Murrieta Creek harmed avifauna, mammals, reptiles, amphibians and fish within the impact area. Untreated sewage contains a mixture of contaminants including a variety of bacteria, protozoans viruses, and toxic chemicals and high concentrations of nitrogen and phosphorous. Viruses and bacteria are a potential vehicle for disease transmission to ecological receptors. Wildlife exposure to untreated sewage can result in suppression of the immune response system, alterations in defense mechanisms, and the depression of essential biological activity that can lead to susceptibility to disease and latent infections. Amphibians are especially sensitive to a number of bacteria found in raw sewage.

On December 29, 2009, EMWD retained an environmental consulting firm to conduct a reconnaissance level survey of the discharge area to determine impacts to biological resources within Murrieta Creek. The initial survey was conducted on December 30, 2009, five days after the discharge had occurred. EMWD provided the results of the biological survey as part of its response to Investigative Order R9-2010-0009.²

The survey area consisted of a 2-mile stretch of Murrieta Creek including areas upstream and downstream of the spill area. Approximately 20 acres of marsh/wetland dominated by *Typha* (cattails) and *Salix* (willows) absorbed the initial impact of the sewage spill. At the time of spill, Murrieta Creek had been recently mowed to maintain its flood control capacity (Figure 3).



Figure 3. Murrieta Creek Spill Site

² January 25, 2010, *Biological Resources Damage Assessment Within Murrieta Creek in Relation to the Temecula Valley Regional Water Reclamation Facility December 25, 2009 Sewage Spill* (prepared by Tom Dodson & Associates).

According to the California Natural Diversity Database (CNDDB) two special status plant species have a low to moderate potential of occurrence within the study area. The results of the one-day survey indicate that no special status plant species were observed within the study area.

The CNDDB shows that ten wildlife species of Special Concern have been documented within the study area, including the Southwestern pond turtle (*Actinemys marmorata, pallida*), arroyo chub (*Gila orcutti*) and the federally endangered least Bell's vireo (*Vireo belli pusillus*). Due to the recent mowing of the creek, there was not suitable habitat for least Bell's Vireo at the time of the spill, but the findings of the report assume that arroyo chub, southwestern pond turtle, and other native and non-native amphibians were present in the spill area and absorbed direct impacts from the discharge of sewage.

Based on the findings and assumptions made in EMWDs biological impact assessment, the spill of 2.39 million gallons of untreated sewage to Murrieta Creek adversely affected the quality of water needed to sustain the WARM and WILD beneficial uses of Murrieta Creek.

EMWD posted warning signs by 4:00 pm on December 26, 2009, along the spill area of Murrieta Creek. The warning signs at Murrieta Creek remained posted for 44 days until February 9, 2010, which was 30 days after water quality monitoring results showed that fecal coliform was less than the Basin Plan REC-2 Water Quality Objective of 2,000 MPN/100 mL. The REC-2 beneficial use for Murrieta Creek was removed for approximately 14 days after the spill due to the high fecal coliform levels. This, along with leaving the warning signs up for an additional 30 days, had the effect of restricting the public's ability to enjoy the beneficial use of the Creek for a total of 44 days.

Calculation of Discharge Volume

EMWD calculated that 2.39 million gallons of untreated sewage discharged to Murrieta Creek using information contained in operational reports including electronic and hardcopy flow records. Influent flow readings at the plant "flat-lined" due to the PLC faulting, so the influent was calculated by using the maximum influent flow from the last 7 days (14.63 mgd). Secondary effluent flow readings were not affected and are considered accurate. Therefore to calculate the volume of the spill, EMWD took the difference between the estimated influent flow and the secondary effluent:

$$\begin{aligned} (\text{Estimated Inf. Flow}) - (\text{Sec. Flow}) &= (\text{Unaccounted Flow}) \\ 14.63 \text{ mgd} - 12.24 \text{ mgd} &= 2.39 \text{ mgd} \end{aligned}$$

An estimated 966,800 gallons of sewage, or 40 percent of the total volume of sewage discharged, was recovered and returned to the collection system by

the EMWD staff. The remaining 1,423,200 gallons entered Murrieta Creek and percolated into the fine to coarse grained sand and gravel and groundwater aquifer of the creek.

Based on the information provided in EMWDs technical report, it is unlikely that there were impacts to the MUN beneficial use of Murrieta Creek. Rancho California Water District well 118 is the only municipal supply well within the spill area. It is used on an "as need basis" and was not in production at the time of the spill, and has remained offline since. The well is protected from surface discharges by a thick clay layer at about 30 feet below ground surface (bgs) to 65 feet bgs, isolating the screened surface of the well from direct surface interaction.

The 1.4 million gallons of sewage that was unable to be recovered by the EMWD adversely affected REC-2 beneficial uses. And, as identified in the findings and assumptions made in EMWDs biological impact assessment, the spill adversely affected the quality of water needed to sustain the WARM and WILD beneficial uses of Murrieta Creek.

Due to the dry nature of the creek at the time of the discharge however, it is probable that the biological and vegetative processes within the creek would attenuate the effects of the spill without appreciable acute or chronic effects. Dissolved biodegradable material can be removed from the spill area by microorganisms living on the exposed surfaces of aquatic plants and soils. Decomposers such as bacteria, fungi, and actinomycetes are active in wetlands, breaking down particulate organic matter to carbon dioxide and water. Wetland plants can play a role in nutrient reduction by the uptake of nitrogen and phosphorus. The ultimate fate, however, of the discharged pollutants is unknown.

b. Factor 2 : Physical, Chemical, Biological or Thermal Characteristics of the Discharge

The characteristics of the discharged material posed an **above-moderate** risk or threat to potential receptors. The Enforcement Policy defines above-moderate as:

"Discharged material poses an above-moderate risk or direct threat to potential receptors (i.e., the chemical and/or physical characteristics of the discharged material exceed known risk factors and/or there is substantial concern regarding receptor protection)."

The high degree of toxicity in untreated sewage poses a direct threat to human and ecological receptors. Accordingly, a score of **3** (three) is assigned to Factor 2.

Water Quality Monitoring

On December 26, 2009, EMWD began water quality monitoring upstream, downstream, and within the spill area. Monitoring occurred on at least a weekly basis until February 23, 2010 (Exhibit 3 is a map showing the locations of the sampling locations). At the request of Camp Pendleton additional sampling was conducted at the Santa Margarita River (SMR) confluence, and Temecula Creek was sampled as a reference site to compare both the SMR confluence and Murrieta Creek (Exhibit 4).

Sampling results showed that within the first week after the discharge, levels of Ammonia-Nitrogen (NH₃-N) and Biological Oxygen Demand (BOD) showed significant reduction, 14 mg/L to less than 2 mg/L NH₃-N and 90 mg/L to 6 mg/L BOD, respectively.

Within two weeks of the spill, fecal coliform counts had been reduced from greater than 160,000 MPN/100 mL to 70 MPN/ 100mL at the Via Montezuma sampling location. As established in the Basin Plan, the Water Quality Objective for fecal coliform in REC-2 waters for any thirty day period shall not exceed 2000 MPN/ 100ml.

Additional sampling at the SMR confluence showed that the spill did not appear to adversely impact the river at that location. Monitoring results for BOD and Fecal coliform were comparable to the reference site sampling conducted in Temecula Creek.

c. Factor 3: Susceptibility to Cleanup or Abatement

Pursuant to the Enforcement Policy a score of 0 is assigned for this factor if 50 percent or more of the discharge is susceptible to cleanup or abatement. A score of 1 is assigned for this factor if less than 50 percent of the discharge is susceptible to cleanup or abatement.

Approximately 40 percent of the discharge was susceptible to cleanup or abatement. Accordingly, a score of 1 (one) is assigned to the penalty calculation methodology.

2. Step 2: Assessments for Discharge Violations

Water Code section 13350(e) states that a Regional Water Board may impose civil liability on either a daily basis or on a per gallon basis, but not both. In the case of a high volume discharge, the Enforcement Policy provides that the water boards shall determine an initial liability amount on a per gallon basis using the Potential for Harm score (step 1) and the Extent of Deviation from the Requirement of the violation.

a. Extent of Deviation from Requirement

The discharge of 2.39 million gallons of untreated sewage is a moderate deviation from required standards (Discharge Prohibitions). Accordingly, using the Potential for harm score of 7 (seven) and “Table 1 – Per Gallon Factor for Discharges” of the Enforcement Policy, the per-gallon deviation factor is **0.2**.

The penalty calculation methodology defines a moderate deviation as:

“The intended effectiveness of the requirement has been partially compromised (e.g., the requirement was not met, and the effectiveness of the requirement is only partially achieved).”

EMWD was able to quickly capture and reintroduce approximately 40 percent of the untreated sewage discharged from the TVRWRF back into the collection system for treatment, thus achieving partial effectiveness in complying with the requirements of Order No. R9-2000-0165.

b. Initial Amount of the ACL

The maximum per gallon liability amount allowed under Water Code section 13350(e) is ten dollars (\$10) per gallon of waste discharged. Since the volume of sewage spills can be very large (as in this instance), however, the Enforcement Policy caps the maximum initial liability for high volume discharges at two dollars (\$2.00) per gallon in this step of the penalty calculation.

Calculating the initial base amount of the ACL for the discharge is achieved by multiplying:

(Per Gallon Deviation Factor) X (Gallons) X (Adjusted Maximum per Gallon) =
(Initial ACL Amount)

$$(0.2) \times (2,390,000) \times (\$2.00) = \mathbf{\$956,000}$$

3. Step 3: Per Day Assessments for Non-Discharge Violations

Non-discharge violations are not alleged in this technical analysis.

4. Step 4: Adjustment Factors

The Enforcement Policy describes three factors related to the violator's conduct that should be considered for modification of the amount of initial liability: the violator's culpability, the violator's efforts to cleanup or cooperate with regulatory authorities after the violation, and the violator's compliance history. After each of these factors is considered for the violations involved, the applicable factor should be multiplied by the proposed amount for each violation to determine the revised amount for that violation.

a. Adjustment for Culpability

For culpability, the Enforcement Policy suggests an adjustment resulting in a multiplier between 0.5 to 1.5, with the lower multiplier for accidental incidents, and the higher multiplier for intentional or negligent behavior. In this case a culpability multiplier of **1.3** has been selected as detailed below.

Like other wastewater treatment plants of similar size and scope, TVRWRF relies on programmable logic controllers (PLCs) for automated operation of the plant. The PLCs exchange data with two Supervisory Control and Data Acquisition (SCADA) computers which provide a graphical interface for plant operators, report alarm conditions both locally and to the IOC, and record plant data, conditions and events (Figure 4).

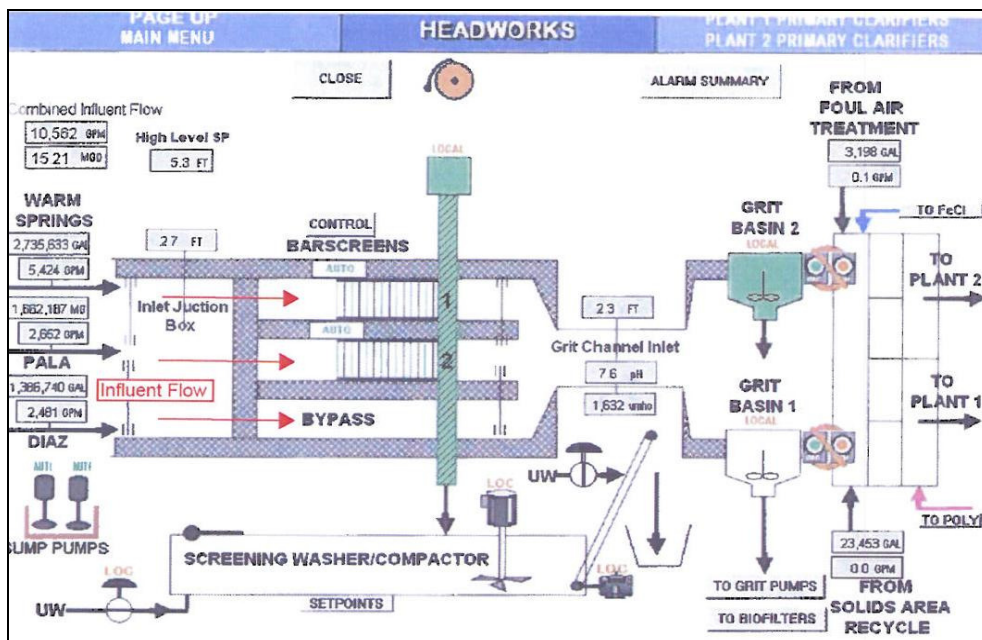


Figure 4. SCADA Graphical Interface

At the time of the spill discovery on December 26, 2010, the SCADA system was not displaying any alarm conditions on the first page of the enunciator screen (1 of 3 screens). The third and last page of the interface, however, was showing a YIC 12 PLC failure alarm associated with the influent structure. The YIC 12 PLC is responsible for sending run commands to the barscreen cleaners based on the influent levels at the headworks. EMWDs investigation determined that the spill was a result of the PLCs failure to send a run command to the barscreen cleaners, thereby allowing the influent structure to become clogged with debris and causing untreated sewage to spill.

The PLCs use “watchdog” timers to ensure that the PLCs are functioning properly. If a PLC fails, the Integrated Operations Center in Perris is notified. EMWDs investigation found that on December 25, 2009, at 3:40 pm, PLC 12 failed, and the failure was reported to the IOC. The IOC contacted the on call operator for the TVRWRF, who was logged onto SCADA at his home. The on call operator acknowledged the alarm on the first page of the screen, but failed to check the third page of the screen where the PLC12 alarm was flashing red. Had the on call operator reviewed the third screen and located the flashing critical alarm, he would have been prompted to dispatch a Control Technician to resolve the problem.

A design flaw in the TVRWRF’s SCADA system allowed the on-call operator to acknowledge all the failure alarms on the first page of the screen and release them. This effectively cancelled the dispatch warning from going to the IOC. A review of the EMWDs other treatment plants showed that PLC failure alarms cannot be released or acknowledged from the first page of the screen, and that PLC failure alarms at the other treatment plants will continue to send an alarm until the problem is repaired. The TVRWRF SCADA system was the first installed by EMWD, and was never re-configured to address this design flaw.

It is reasonable to conclude that as upgraded SCADA systems were installed at EMWDs other facilities, that a review of the TVRWRF system should have occurred to bring it up to date with the improved systems.

Additionally, the PLC was a single point of failure in the system. PLC12 was the only means of issuing a run command to the barscreen cleaners, and no redundant mechanical controls were in place to ensure that the barscreen cleaners functioned properly in case of a PLC failure. Other treatment plants operated by EMWD are equipped with hard wired high level floats that are independent of the PLC and will mechanically operate the barscreen cleaners when influent flows reach a high level. This type of system safeguard allows the barscreen cleaners to run continuously when high influent levels are present.

The system design flaw allowing the PLC to be the only control to initiate the bar screen cleaners operation is a critical flaw in the system, and as documented by EMWD, is unique to the TVRWRF. All of the other treatment facilities operated by EMWD have redundant controls to ensure the intake screens remain free of debris. As noted in EMWDs response to the Investigative Order, the TVRWRF headworks had been in place for ten years and has a history of problems associated with its operations. It is reasonable to assume that EMWD should have identified this design flaw through adequate system review and maintenance of the structure, and should have provided upgrades to the system to bring it up to the standards of its other facilities.

And lastly, EMWD failed to adequately train its plant operators in their use of the SCADA system, and their response to system alarms. Had the plant operator at the time of the alarm taken the time to look through the other pages of the SCADA interface, the magnitude of the sewage spill could have been lessened, by ensuring that a technician was sent out to investigate.

EMWDs technical report findings show that the spill of 2.39 million gallons of untreated sewage to Murrieta Creek could have been prevented if reasonable actions had been taken to ensure the TVRWRF influent system, SCADA alarm system, and system operator training were upgraded to meet the prevailing standards of the other treatment facilities under their ownership and operation.

EMWD is solely responsible for ensuring proper installation, operation and maintenance of all equipment and systems associated with the TVRWRF. EMWD was negligent in ensuring that the systems in place at the TVRWRF met the prevailing standards established for all of their other facilities, and that their on-call operators were adequately trained to respond to alarms. This negligence justifies a higher factor for culpability.

b. Adjustment for Cleanup and Cooperation

For cleanup and cooperation, the Enforcement Policy suggests an adjustment should result in a multiplier between 0.75 to 1.5, with the lower multiplier where there is a high degree of cleanup and cooperation. In this case a Cleanup and Cooperation multiplier of **0.75** has been selected.

Upon arrival at the TVRWRF on December 26, 2009, the TVRWRF staff responded quickly to the spill by ceasing the discharge and dispatching pumping equipment to enable them to recover 966,800 gallons of sewage (40 percent of total discharge).

EMWD staff was cooperative in assisting San Diego Water Board Staff during the December 28, 2010, inspection of the spill site. Additionally, EMWD was timely and thorough in their response to Investigative Order No.R9-

c. Adjustment for History of Violations

The Enforcement Policy suggests that where there is a history of repeat violations, a minimum multiplier of 1.1 should be used to reflect this. In this case, a multiplier of **1.1** was selected for EMWDs recent history of high volume sewage spills.

A review of the California Integrated Water Quality System (CIWQS) Sanitary Sewer Overflow (SSO) database and San Diego Water Board files shows that EMWD has a history of repeat violations of public sewage spills in recent years. On November 14, 2006 an EMWD construction crew ruptured a pressurized 10-inch force main at the Diaz Road lift station which resulted in 1.07 million gallons of untreated sewage being discharged into Murrieta Creek. This spill resulted in the San Diego Water Board assessing an Administrative Civil Liability in the amount of \$53,500.

Subsequent to the above incident, in 2007, EMWD reported ten public sanitary sewer overflows (SSOs) totaling 84,819 gallons of sewage discharged. In 2008, EMWD reported four public SSOs totaling 10,352 gallons of sewage discharged. In 2009, in addition to the 2.39 million gallons discharged from the TVRWRF, EMWD reported six public SSOs totaling 22,190 gallons of sewage discharged. To date in 2010, EMWD has had one public SSO totaling 9,075 gallons of sewage discharged.

d. Adjustment for Multiple Violations Resulting from the Same Incident

The Enforcement Policy provides that for situations not addressed by statute, a single base liability amount can also be assessed for multiple violations resulting from the same incident at the discretion of the water boards under certain, specific circumstances. Except where statutorily required, however, multiple violations shall not be grouped and considered as a single base liability amount when those multiple violations each result in a distinguishable economic benefit to the violator.

This factor is applicable in this instance. Pursuant to Water Code section 13350(a) either a per-day or a per-gallon administrative civil liability can be imposed. In the case of a high volume sewage discharge, a per-gallon liability is the appropriate response to the discharge.

e. Adjustment for Multiple Day Violations

The Enforcement Policy provides that for violations lasting more than 30 days, the San Diego Water Board may adjust the per-day basis for civil liability if certain findings are made and provided that the adjusted per-day basis is no less than the per day economic benefit, if any, resulting from the violation.

The discharge of 2.39 million gallons of untreated sewage did not last more than 30 days, therefore, this adjustment factor does not apply.

5. Step 5: Determination of Total Base Liability Amount

The Total Base Liability amount of **\$1,025,310** is determined by adding the initial liability amounts for each violation and applying the adjustment factors in section 4.2. Accordingly, the Total Base Liability amount for the violations is calculated by multiplying the total base liability by the adjustment factors:

$$\begin{aligned} &(\text{Total Base Liability}) \times (\text{Culpability}) \times (\text{History of Violations}) \times (\text{Cleanup}) = \\ &(\$956,000) \times (1.3) \times (1.1) \times (0.75) = \$1,025,310 \end{aligned}$$

6. Step 6: Ability to Pay and Ability to Continue Business

The Enforcement Policy provides that if the San Diego Water Board has sufficient financial information necessary to assess the violator's ability to pay the Total Base Liability or to assess the effect of the Total Base Liability on the violator's ability to continue in business, then the Total Base Liability amount may be adjusted downward. Similarly, if a violator's ability to pay is greater than similarly situated dischargers, it may justify an increase in the amount to provide a sufficient deterrent effect.

It is not anticipated that EMWD would be unable to pay the recommended liability. According to October 19, 2009, *Eastern Municipal Water District Comprehensive Annual Financial Report for the Fiscal Year Ended June 30, 2009*, EMWD has formally adopted a *cash reserve policy* which sets aside designated reserves within its four main funds; operating, construction, debt service and trust. Within each of these funds are various reserves established to meet internal and /or external legal requirements, and to mitigate unexpected occurrences.

EMWDs budget for Fiscal Year 2010/11 projects total operating revenues of \$217,039,915, and total operating expenses of \$173,174,757. In addition, other financing options are available to EMWD, who has been assigned an AA credit rating.

Accordingly, this penalty factor in this step is neutral and does not weigh either for or against adjustment of the Total Base Liability. EMWD may provide additional financial information in response to the Complaint to demonstrate that an adjustment is warranted.

7. Step 7: Other Factors as Justice May Require

The Enforcement Policy provides that If the San Diego Water Board believes that the amount determined using the above factors is inappropriate, the liability amount may be adjusted under the provision for “other factors as justice may require,” if express finding are made to justify this. In addition, the costs of investigation should be added to the liability amount according to the Enforcement Policy.

The costs of San Diego Water Board investigation to date are \$10,000. As a result the liability amount is recommended to be adjusted upward by \$10,000, bringing the total proposed liability to **\$1,035,310**.

No other factors are being considered in determination of the proposed liability amount.

8. Step 8: Economic Benefit

The Enforcement Policy directs the San Diego Water Board to determine any economic benefit of the violations based on the best available information, and suggests that the amount of the administrative civil liability should exceed this amount whether or not economic benefit is a statutory minimum. The economic benefit of the violations is estimated to be **\$24,654**.

EMWD derived economic benefit from not having to treat the 1,423,200 gallons of sewage that were not recovered. EMWD has provided documentation showing that for 2009/2010, the allocated cost for the TVRWRF to treat 1,000,000 gallons of sewage is \$1,409. Thus the EMWD derived an economic benefit of: 1.423 millions gallons X \$1409/million gallons treated = \$2,005

EMWD also derived economic benefit from the delay of updating the TVRWRF SCADA system to the prevailing standards of its other treatment facilities. EMWD provided documentation to show that the recent SCADA system upgrades cost \$11,170.

EMWD derived additional economic benefit from delays in providing a back-up mechanical system to run the barscreen cleaners in case of a PLC failure. EMWDs cost to remedy this situation was reported to be \$4,279.

And lastly, EMWD derived economic benefit from this failure to provide adequate training to their operations staff on the SCADA system and appropriate alarm response. The additional training EMWD provided its operations staff cost \$7,200.

9. Step 9: Maximum and Minimum Liability Amounts

The maximum liability that the San Diego Water Board may assess pursuant to Water Code section 13350(e) is ten dollars (\$10.00) per gallon. Therefore, the maximum liability the San Diego Water board may assess is **\$23,900,000**.

Water Code section 13350(e) does not set a minimum liability when utilizing the per gallon option. The 2009 Enforcement Policy requires that:

“The adjusted Total Base Liability shall be at least 10 percent higher than the Economic Benefit Amount so that liabilities are not construed as the cost of doing business and that the assessed liability provides a meaningful deterrent to future violations.”

Therefore, the minimum liability amount the San Diego Water Board may assess is **\$27,119**. The recommended liability falls within the allowable statutory range for minimum and maximum amounts.

10. Step 10: Final Liability Amount

The total proposed civil liability in this matter is \$1,035,310, which corresponds to \$0.43 per gallon.

The proposed amount of civil liability attributed to the discharge of 2.39 million gallons of untreated sewage in violation of Waste Discharge Prohibitions contained in San Diego Water Board Order No. R9-2000-0165 was determined by taking into consideration the factors in Water Code sections 13327 and 13350(e), and the penalty calculation methodology in the 2009 Enforcement Policy (Exhibit 5).

The proposed civil liability is appropriate for this untreated sewage discharge based on the following reasons:

- a. The discharge of large amounts of raw sewage into waters of the United States adversely affected beneficial uses of Murrieta Creek, including non-contact water recreation (REC-2), warm freshwater habitat (WARM) and wildlife habitat (WILD).
- b. The high degree of toxicity in untreated sewage posed a threat to beneficial uses.

- c. EMWD failed to implement upgrades, improvements, and training procedures in a timely manner at the TVRWRF that would have prevented or reduced the amount of the SSO.
- d. The proposed civil liability assessment is sufficient to recover costs incurred by staff of the San Diego and State Water Board, and it serves as deterrent for future negligent violations.

Exhibits

Exhibit 1: Vicinity Map

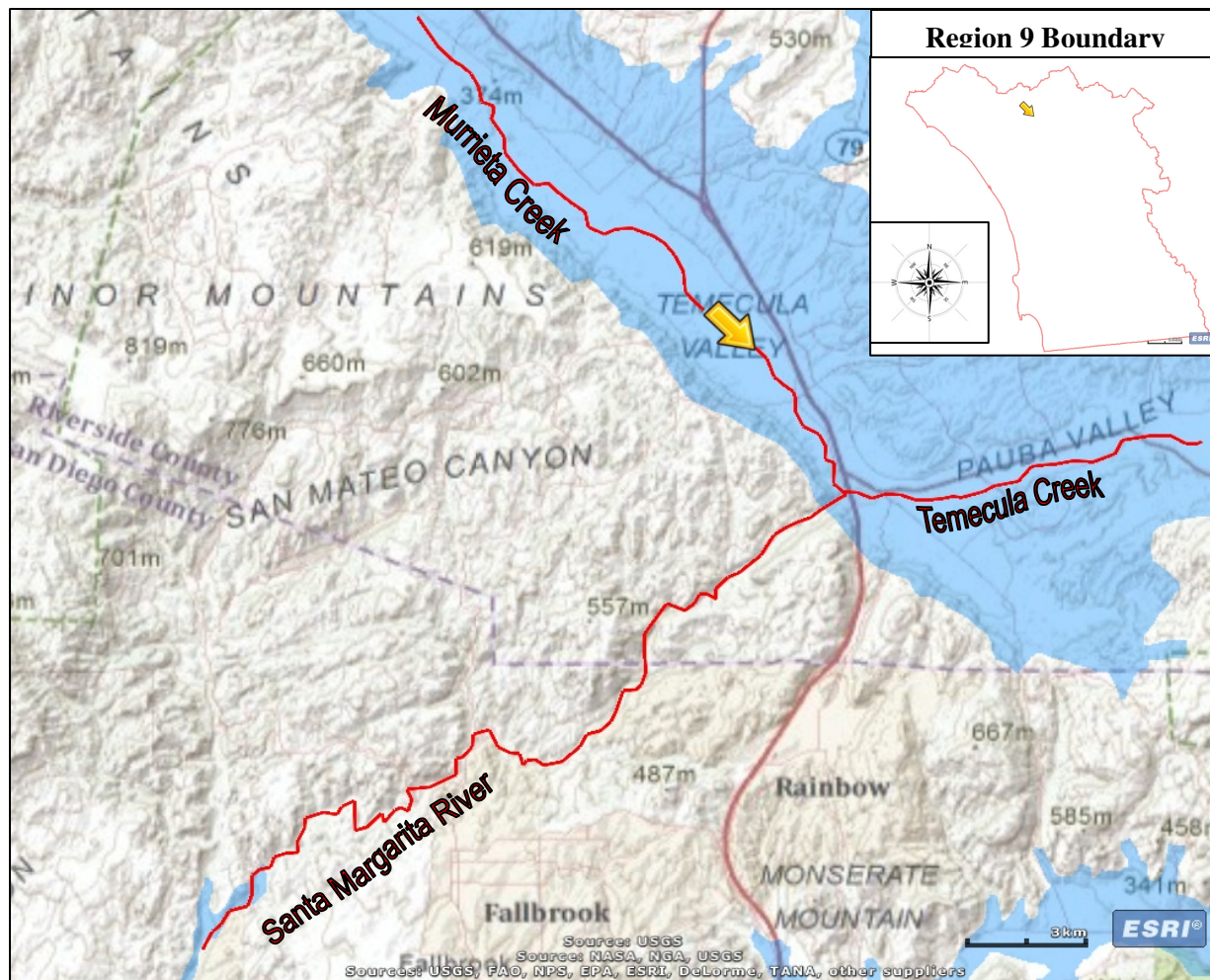
Exhibit 2: Sewage Spill Discharge Path

Exhibit 3: Murrieta Creek Monitoring Locations

Exhibit 4: Temecula Creek Monitoring Locations

Exhibit 5: Penalty Calculation Summary Sheet

Exhibit 1: Vicinity Map



Impaired Water Bodies Downstream of Spill	Pollutants
Murrieta Creek	Chlorpyrifos Copper Iron Manganese Nitrogen Toxicity
Santa Margarita River	Enterococcus Fecal Coliform Phosphorus Nitrogen Toxicity

Key	
	Spill Site
	Impaired Water Bodies
	Temecula Valley Groundwater Basin

Exhibit 2: Sewage Spill Discharge Path



Figure 4-13. Murrieta Creek Sampling Locations

Figure 4-14. Murrieta Creek, Temecula Creek & Santa Margarita River

Exhibit No. 5
Discharger: EMWD

Penalty Methodology Decisions
ACL Complaint No. R9-2010-0085

Step 1: Potential Harm Factor				
	Harm/Potential Harm to Beneficial Uses	Physical, Chemical, Biological or Thermal Characteristics	Susceptibility to Cleanup or Abatement	Total Potential for Harm
Violations	[0 - 5]	[0 - 4]	[0 or 1]	[0 - 10]
Sewage Spill	3	3	1	7

Step 2: Assessments for Discharge Violations				
	Per Gallon Factor			Statutory/ Adjusted Max per Gallon
Violations	Potential for Harm [0 - 10]	Deviation from Requirement [minor, moderate, major]	High Volume Discharges	Total Per Gallon Factor [\$]
Sewage Spill	7	moderate	yes	0.2

Step 3: Per Day Assessments for Non-Discharge Violations				
	Per Day Factor			Statutory/ Adjusted Max
Violations	Potential for Harm [minor, moderate, major]	Deviation from Requirement [minor, moderate, major]	Total Per Day Factor	[\$]
na	na	na	na	na

Step 4: Adjustments					
Violations	Culpability [0.5 - 1.5]	Cleanup and Cooperation [0.75 - 1.5]	History of Violation	Multiple Violations (Same Incident)	Multiple Day Violations
sewage spill	1.3	0.75	1.1	yes	na

Step 5: Total Base Liability Amount
Sum of Steps 1- 4
\$1,025,310

Step 8: Economic Benefit
\$24,654

Step 6: Ability to Pay/Continue in Business
[Yes, No, Partly, Unknown]
Yes

Step 9	
Minimum Liability Amount	Maximum Liability Amount
\$27,119	\$23,900,000

Step 7: Other Factors as Justice May Require	
Costs of Investigation and Enforcement Adjustment	Other
\$10,000	na

Step 10: Final Liability Amount
\$1,035,310